

SEQUENCE LISTING

<110> Trimeris, Inc.

<120> Pharmaceutical composition for improved administration of HIV gp41-derived peptides, and its use in therapy

<130> TRM-003

<150> US 60/414,441

<151> 2002-09-27

<160> 95

<170> PatentIn version 3.2

<210> 1

<211> 60

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 1

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val
35 40 45

Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile
50 55 60

<210> 2

<211> 64

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 2

Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile Trp Asn Asn
1 5 10 15

Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu
20 25 30

Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu
35 40 45

Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
50 55 60

<210> 3
<211> 38
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 3

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
20 25 30

Arg Tyr Leu Lys Asp Gln
35

<210> 4
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 4

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 5
<211> 39
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 5

Trp Gln Glu Trp Glu Gln Lys Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp
20 25 30

Ala Ser Leu Trp Glu Trp Phe
35

<210> 6
<211> 43
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 6

Gly Ser Thr Met Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg
1 5 10 15

Gln Leu Leu Ser Gly Ile Val Gln Gln Asn Asn Leu Leu Arg Ala
20 25 30

Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr
35 40

<210> 7
<211> 54
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 7

Gly Ser Thr Met Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg
1 5 10 15

Gln Leu Leu Ser Gly Ile Val Gln Gln Asn Asn Leu Leu Arg Ala
20 25 30

Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys
35 40 45

Gln Leu Gln Ala Arg Ile
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<210> 8
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 8

Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser
1 5 10 15

Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln
20 25 30

Gln His Leu Leu
35

<210> 9
<211> 38
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 9

Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser
1 5 10 15

Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln
20 25 30

Gln His Leu Leu Gln Leu
35

<210> 10
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<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 10

Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser
1 5 10 15

Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln
20 25 30

Gln His Leu Leu Gln Leu Thr Val
35 40

<210> 11
<211> 50
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 11

Gly Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser
1 5 10 15

Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln
20 25 30

Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala
35 40 45

Arg Ile
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<210> 12
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 12

Ala Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly
1 5 10 15

Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln
20 25 30

His Leu Leu Gln
35

<210> 13
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 13

Arg Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile
1 5 10 15

Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His
20 25 30

Leu Leu Gln Leu
35

<210> 14
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 14

Ser Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val
1 5 10 15

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
20 25 30

Leu Gln Leu Thr
35

<210> 15
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 15

Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln
1 5 10 15

Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu
20 25 30

Gln Leu Thr
35

<210> 16
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 16

Met Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln
1 5 10 15

Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu
20 25 30

Gln Leu Thr Val
35

<210> 17
<211> 34
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 17

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr

<210> 18
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 18

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val
35

<210> 19
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 19

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val Trp
35

<210> 20
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<212> PRT
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<220>
<223> synthesized

<400> 20

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val Trp Gly
35

<210> 21
<211> 38
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 21

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val Trp Gly Ile
35

<210> 22
<211> 44
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 22

Thr Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln
1 5 10 15

Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
20 25 30

Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg
35 40

<210> 23
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<212> PRT

<213> Artificial

<220>

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<400> 23

Leu Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln
1 5 10 15

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
20 25 30

Thr Val Trp Gly
35

<210> 24

<211> 42

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 24

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
35 40

<210> 25

<211> 47

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 25

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr
35 40 45

<210> 26
<211> 49
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 26

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys

<210> 27
<211> 51
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 27

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys Asp Gln
50

<210> 28
<211> 36
<212> PRT
<213> Artificial

<220>
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<400> 28

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Ile Leu
35

<210> 29
<211> 45
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 29

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40 45

<210> 30
<211> 41
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 30

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 31
<211> 34
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 31

Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly
1 5 10 15

Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys
20 25 30

Asp Gln

<210> 32
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 32

Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu Glu Leu
35

<210> 33
<211> 41
<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 33

Cys Gly Gly Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 34

<211> 31

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 34

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val
20 25 30

<210> 35

<211> 41

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 35

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
20 25 30

Arg Tyr Leu Lys Asp Gln Gly Gly Cys
35 40

<210> 36
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<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 36

Cys Gly Gly Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln Gly Gly Cys
35 40

<210> 37
<211> 39
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 37

Leu Ser Gly Ile Val Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu
1 5 10 15

Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu
20 25 30

Gln Ala Arg Ile Leu Ala Val
35

<210> 38
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 38

Tyr Thr Asn Thr Ile Tyr Thr Leu Leu Glu Glu Ser Gln Asn Gln Gln

1

5

10

15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 39
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 39

Tyr Thr Gly Ile Ile Tyr Asn Leu Leu Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Asn Leu
20 25 30

Trp Asn Trp Phe
35

<210> 40
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<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 40

Tyr Thr Ser Leu Ile Tyr Ser Leu Leu Glu Lys Ser Gln Ile Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 41
<211> 36

<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 41

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Phe Asn Phe Phe
35

<210> 42
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 42

Trp Gln Glu Trp Glu Gln Lys Val Arg Tyr Leu Glu Ala Asn Ile Thr
1 5 10 15

Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln Glu Lys Asn Glu Tyr Glu
20 25 30

Leu Gln Lys Leu
35

<210> 43
<211> 42
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 43

Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu
1 5 10 15

Glu Ser Gln Asn Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu

20

25

30

Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40

<210> 44
<211> 48
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 44

Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu
1 5 10 15

Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu
20 25 30

Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 45
<211> 42
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 45

Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr
1 5 10 15

Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys
20 25 30

Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys
35 40

<210> 46
<211> 46
<212> PRT
<213> Artificial

<220>

<223> synthesized

<400> 46

Trp Gln Glu Trp Glu Gln Lys Val Arg Tyr Leu Glu Ala Asn Ile Thr
1 5 10 15

Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln Glu Lys Asn Glu Tyr Glu
20 25 30

Leu Gln Lys Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 47

<211> 50

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 47

Asn Asn Met Thr Trp Gln Glu Trp Glu Gln Lys Val Arg Tyr Leu Glu
1 5 10 15

Ala Asn Ile Thr Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln Glu Lys
20 25 30

Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp Ala Ser Leu Trp Asn
35 40 45

Trp Phe

50

<210> 48

<211> 36

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 48

Trp Asn Trp Phe Ile Thr Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln
1 5 10 15

Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp Ala Ser Leu

20

25

30

Trp Asn Trp Phe
35

<210> 49
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<212> PRT
<213> Artificial

<220>
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<400> 49

Trp Gln Glu Trp Asp Arg Glu Ile Ser Asn Tyr Thr Ser Leu Ile Thr
1 5 10 15

Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln Glu Lys Asn Glu Tyr Glu
20 25 30

Leu Gln Lys Leu Asp Glu Trp Ala Ser Leu Trp Glu Trp Phe
35 40 45

<210> 50
<211> 40
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 50

Trp Gln Glu Trp Glu Arg Glu Ile Ser Ala Tyr Thr Ser Leu Ile Thr
1 5 10 15

Ala Leu Leu Glu Gln Ala Gln Ile Gln Gln Glu Lys Ile Glu Tyr Glu
20 25 30

Leu Gln Lys Leu Glu Trp Glu Trp
35 40

<210> 51
<211> 39
<212> PRT
<213> Artificial

<220>

<223> synthesized

<400> 51

Trp Gln Glu Trp Asp Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp
20 25 30

Ala Ser Leu Trp Asn Trp Phe
35

<210> 52

<211> 39

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 52

Trp Gln Glu Trp Asp Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Glu Trp
20 25 30

Ala Ser Leu Trp Glu Trp Phe
35

<210> 53

<211> 35

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 53

Trp Gln Glu Trp Asp Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Glu Trp
20 25 30

Glu Trp Phe

<210> 54
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 54

Trp Gln Glu Trp Glu Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Ile Glu Tyr Glu Leu Gln Lys Leu Ile Glu Trp
20 25 30

Glu Trp Phe
35

<210> 55
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 55

Trp Gln Glu Trp Glu Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Ile Glu Trp
20 25 30

Glu Trp Phe
35

<210> 56
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 56

Trp Gln Glu Trp Glu Arg Glu Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Ile Glu Tyr Glu Leu Gln Lys Leu Asp Glu Trp
20 25 30

Glu Trp Phe
35

<210> 57
<211> 39
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 57

Trp Gln Glu Trp Glu Gln Lys Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp
20 25 30

Ala Ser Leu Trp Asn Trp Phe
35

<210> 58
<211> 39
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 58

Trp Gln Glu Trp Glu Gln Lys Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Asp Lys Trp
20 25 30

Ala Gly Leu Trp Glu Trp Phe
35

<210> 59

<211> 39
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 59

Trp Gln Glu Trp Glu Gln Lys Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Asn Glu Tyr Glu Leu Gln Lys Leu Ala Glu Trp
20 25 30

Ala Gly Leu Trp Ala Trp Phe
35

<210> 60
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 60

Trp Gln Glu Trp Glu Gln Lys Ile Thr Ala Leu Leu Glu Gln Ala Gln
1 5 10 15

Ile Gln Gln Glu Lys Ile Glu Tyr Glu Leu Gln Lys Leu Ile Glu Trp
20 25 30

Glu Trp Phe
35

<210> 61
<211> 41
<212> PRT
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<220>
<223> synthesized

<400> 61

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Ala Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 62
<211> 41
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 62

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Val Ala Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 63
<211> 49
<212> PRT
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<220>
<223> synthesized

<400> 63

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Ala Leu Gln Ala Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys

<210> 64

<211> 51
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 64

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Ala Leu Gln Ala Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys Asp Gln
50

<210> 65
<211> 49
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 65

Gln Ala Arg Gln Leu Val Ser Gly Leu Val Gln Gln Gln Asn Asn Ile
1 5 10 15

Leu Arg Ala Leu Glu Ala Thr Gln His Ala Val Gln Ala Leu Val Trp
20 25 30

Gly Val Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu Arg Tyr Ile
35 40 45

Lys

<210> 66
<211> 49
<212> PRT
<213> Artificial

<220>

<223> synthesized

<400> 66

Gln Ile Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Ile Gln His Ala Leu Gln Ala Ile Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys

<210> 67

<211> 49

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 67

Gln Ala Arg Gln Leu Val Ser Gly Leu Val Gln Gln Gln Asn Asn Ile
1 5 10 15

Leu Arg Ala Leu Glu Ala Thr Gln His Ala Val Gln Ala Leu Val Trp
20 25 30

Gly Val Arg Gln Leu Gln Ala Arg Val Leu Ala Leu Glu Arg Tyr Ile
35 40 45

Lys

<210> 68

<211> 51

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 68

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu

1

5

10

15

Leu Arg Ala Ile Glu Ala Thr Gln His Ala Val Gln Ala Leu Val Trp
20 25 30

Gly Val Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu Arg Tyr Ile
35 40 45

Lys Asp Gln
50

<210> 69
<211> 51
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 69

Gln Ala Arg Gln Leu Val Ser Gly Leu Val Gln Gln Gln Asn Asn Ile
1 5 10 15

Leu Arg Ala Leu Glu Ala Gln Gln His Ala Leu Gln Ala Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu Arg Tyr Ile
35 40 45

Lys Asp Gln
50

<210> 70
<211> 51
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 70

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Ala Leu Gln Ala Thr Val Trp
20 25 30

Gly Val Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys Asp Gln
50

<210> 71
<211> 41
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 71

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Leu Thr Val Phe Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 72
<211> 49
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 72

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Phe
20 25 30

Gly Ile Arg Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys

<210> 73
<211> 51
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 73

Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu
1 5 10 15

Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Ala Thr Val Trp
20 25 30

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
35 40 45

Lys Asp Gln
50

<210> 74
<211> 41
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 74

Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu
1 5 10 15

Leu Gln Ala Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu
20 25 30

Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40

<210> 75
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 75

Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile Trp Asn Asn Met
1 5 10 15

Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile
20 25 30

His Ser Leu Ile
35

<210> 76
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 76

Asn Lys Ser Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp
1 5 10 15

Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu
20 25 30

Glu Ser Gln Asn
35

<210> 77
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 77

Lys Ser Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp
1 5 10 15

Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu
20 25 30

Ser Gln Asn Gln
35

<210> 78
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 78

Ser Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg
1 5 10 15

Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser
20 25 30

Gln Asn Gln Gln
35

<210> 79
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 79

Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu
1 5 10 15

Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln
20 25 30

Asn Gln Gln Glu
35

<210> 80
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 80

Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile
1 5 10 15

Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn
20 25 30

Gln Gln Glu Lys
35

<210> 81
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 81

Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn
1 5 10 15

Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln
20 25 30

Gln Glu Lys Asn
35

<210> 82
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 82

Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn
1 5 10 15

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
20 25 30

Glu Lys Asn Glu
35

<210> 83
<211> 36
<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 83

Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr
1 5 10 15

Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu
20 25 30

Lys Asn Glu Gln
35

<210> 84

<211> 36

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 84

Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr
1 5 10 15

Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys
20 25 30

Asn Glu Gln Glu
35

<210> 85

<211> 36

<212> PRT

<213> Artificial

<220>

<223> synthesized

<400> 85

Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser
1 5 10 15

Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn
20 25 30

Glu Gln Glu Leu
35

<210> 86
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 86

Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu
1 5 10 15

Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu
20 25 30

Gln Glu Leu Leu
35

<210> 87
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 87

Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile
1 5 10 15

His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln
20 25 30

Glu Leu Leu Glu
35

<210> 88
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 88

Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu Glu Leu
35

<210> 89
<211> 35
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 89

Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser
1 5 10 15

Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu
20 25 30

Leu Glu Asp
35

<210> 90
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 90

Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu
1 5 10 15

Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu
20 25 30

Glu Leu Asp Lys
35

<210> 91
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 91

Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile
1 5 10 15

Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu
20 25 30

Leu Asp Lys Trp
35

<210> 92
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 92

Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln
1 5 10 15

Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser
20 25 30

Leu Trp Asn Trp
35

<210> 93
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 93

Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Glu

1

5

10

15

Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
20 25 30

Asn Trp Phe Asn
35

<210> 94
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 94

Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys
1 5 10 15

Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn
20 25 30

Trp Phe Asn Ile
35

<210> 95
<211> 36
<212> PRT
<213> Artificial

<220>
<223> synthesized

<400> 95

Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn
1 5 10 15

Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp
20 25 30

Phe Asn Ile Thr
35